

CLAIMS

1. A container from a film-forming polymer, having at least one wall comprising an effective amount of an oxygen-scavenging composition wherein said oxygen scavenging composition comprises oxidizable metal particles and at least one protic solvent hydrolysable halogen compound and/or its adducts, wherein said protic solvent hydrolysable halogen compound and/or its adducts have been deposited upon the oxidizable metal from an essentially moisture free liquid.
2. The container according to claim 1, wherein said protic solvent hydrolysable halogen compound is a water hydrolysable Lewis acid and/or its adducts and has been deposited upon the oxidizable metal from an essentially moisture free solution comprising an organic solvent.
3. The container according to claim 1 or 2, wherein the oxygen-scavenging composition comprises iron.
4. The container according to claim 3, wherein the protic solvent hydrolysable halogen compound deposited on iron is  $\text{AlCl}_3$ .
5. The container according to claim 4, wherein the  $\text{AlCl}_3$  is deposited in the form of an adduct made from the interaction of  $\text{AlCl}_3$  with at least one organic solvent.
6. The container according claim 1 or 2, wherein the protic solvent hydrolysable halogen compound is deposited in form of an adduct made from the interaction of protic

solvent hydrolysable halogen compound with at least one non-protic solvent, wherein at least one organic solvent is from the group consisting of ethanol, methanol, propanol, butanol, hexanol, diethyl ether, or ethyl acetate.

7. The container according to claim 3, wherein the salt deposited on iron is  $\text{FeCl}_2$ .

8. The container according to any one of claims 3 to 7, wherein the protic solvent hydrolysable halogen compound and/or its adducts is deposited upon the oxidizable metal from an essentially moisture free liquid.

9. The container according to claim 8, wherein the essentially moisture free liquid is ethanol.

10. The container according to claim 8, wherein  $\text{AlCl}_3$  and/or  $\text{FeCl}_2$  are deposited on iron from a solution in an alcohol selected from the group consisting of ethanol, methanol, isopropanol, butanol, and hexanol.

11. The container according to claim 8 wherein the protic solvent hydrolysable halogen compound is selected from the group consisting of  $\text{AlCl}_3$ ,  $\text{FeCl}_2$ ,  $\text{FeCl}_3$ ,  $\text{TiCl}_4$ ,  $\text{SnCl}_4$ ,  $\text{SiCl}_4$ ,  $\text{POCl}_3$ ,  $\text{SOCl}_2$ ,  $\text{Al}(\text{OEt})\text{Cl}_2$  and n-Butyl  $\text{SnCl}_3$ .

12. The container according to any one of claims 1 to 11, wherein the effective amount of the oxygen-scavenging composition is from 100 to 10,000 part by weight per million part by weight of the wall of the container.

13. The container according to any one of claims 1 to 12, wherein the film-forming polymer is an aromatic polyester.

14. The container according to any of claims 1 to 12 wherein the film-forming polymer is a polyester/polyamide blend.

15. The container according to claim 13 or 14, wherein the aromatic polyester is selected from the group consisting of polyethylene terephthalate and copolymers thereof wherein up to 10% by moles of units of terephthalic acid are substituted by units from isophthalic acid and/or naphthalene dicarboxylic acids.

16. The container according to any one of claims 13 to 15, wherein the wall has a transmission Hunter haze of up to 0.04 percent per  $\mu\text{m}$  of the container wall.

17. The container according to any one of claims 13-15, wherein the container is a stretched bottle.

18. The container according to claim 16, wherein the sidewall of the stretched bottle is 280 to 410 microns thick and has Hunter haze values of 20% or less.

19. The container according to claim 16, wherein the container does not exhibit any visible blooms after three days of accelerated oxygen absorbance.

20. An oxygen scavenging composition that reacts with oxygen in the presence of humidity or liquid phase water, comprising oxidizable particles, wherein said oxidizable

particles comprise an oxidizable metal, at least one protic solvent hydrolysable halogen compound and/or its adducts, wherein said protic solvent hydrolysable halogen compound and/or its adducts have been deposited upon the oxidizable metal from an essentially moisture free liquid.

21. The composition according to claim 19, wherein said protic solvent hydrolysable halogen compound is a water hydrolysable Lewis acid and/or its adducts and has been deposited upon the oxidizable metal from an essentially moisture free organic solution.

22. A composition according to claim 20 or 21, wherein the protic solvent hydrolysable halogen compound is  $\text{AlCl}_3$  or its adducts from the interaction with organic electron-donor compounds.

23. A composition according to claim 20 or 21, wherein the protic solvent hydrolysable halogen compound is  $\text{FeCl}_2$ .

24. A composition according to any of claims 20 to 23 wherein the protic solvent hydrolysable halogen compound and/or its adducts, have been deposited upon the oxidizable metal from an essentially moisture free liquid.

25. A composition to claim 20 or 21 wherein the protic solvent hydrolysable halogen compound is selected from the group consisting of  $\text{AlCl}_3$ ,  $\text{FeCl}_2$ ,  $\text{TiCl}_4$ ,  $\text{SnCl}_4$ ,  $\text{SiCl}_4$ ,  $\text{POCl}_3$ ,  $\text{SOCl}_2$ ,  $\text{Al}(\text{OEt})\text{Cl}_2$  and n-Butyl  $\text{SnCl}_3$ .

26. A composition according to claim 20 through 25, wherein the protic solvent hydrolysable halogen compound

is deposited on the oxidizable metal particle from an essentially moisture free ethanol solution.

27. A composition according to any one of claims 20 to 26, wherein the composition is heat-treated at 100° to 250°C for 20-60 minutes.

28. A composition according to any one of claims 20 to 24, wherein the protic solvent hydrolysable halogen compound is present in amount from 0.1 to 50 wt% on the weight of oxidizable metal particles.

29. A composition according to any one of claims 20 to 28, wherein the iron is annealed electrolytic reduced iron having average numeral size of the particles of 5-80  $\mu\text{m}$ .

30. A composition according to any one of claims 20 to 28, wherein the iron has an average diameter less than 1.0  $\mu\text{m}$ .

31. An aromatic polyester wherein a composition according to any one of claims 20 to 30 is incorporated.

32. An aromatic polyester according to claim 31, wherein the polyester is selected from the group consisting of polyethylene terephthalate and the copolymers thereof in which up to 10% by moles of terephthalic acid units are substituted by units from isophthalic acid and/or naphthalene dicarboxylic acids.

33. A preform from an aromatic polyester into which is incorporated an iron-based oxygen-scavenging composition, wherein the intrinsic viscosity loss of the preform

attributed to the scavenger is less than 60% of the I.V. loss of the preform without the scavenger.

34. A preform according to claim 33, wherein the oxygen-scavenging composition is according to any one of claims 19 to 30.

35. A film-forming polymer incorporating oxygen-scavenging compositions according to any one of claims 20 to 30, selected from the group consisting of polyamides, polycarbonate, PVC and polyolefins.

36. An oxygen scavenging particle comprising an oxidizable metal and at least one protic solvent hydrolysable halogen compound and/or its adducts deposited from an essentially moisture free solvent.

37. The particle according to claim 36, wherein said protic solvent hydrolysable halogen compound is a water hydrolysable Lewis acid and/or its adducts.

38. A particle according to claim 36 or 37, wherein the protic solvent hydrolysable halogen compound is  $\text{AlCl}_3$  or its adducts from the interaction with organic electron-donor compounds.

39. A particle according to claim 36 or 37, wherein the protic solvent hydrolysable halogen compound is  $\text{FeCl}_2$ .

40. A particle according to any of claims 36 to 39 wherein the protic solvent hydrolysable halogen compound and/or its adducts, have been deposited upon the oxidizable metal from an essentially moisture free liquid.

41. A particle according to claim 36 or 37 wherein the protic solvent hydrolysable halogen compound is selected from the group consisting of  $\text{AlCl}_3$ ,  $\text{FeCl}_2$ ,  $\text{TiCl}_4$ ,  $\text{SnCl}_4$ ,  $\text{SiCl}_4$ ,  $\text{POCl}_3$ ,  $\text{SOCl}_2$ ,  $\text{Al}(\text{OEt})\text{Cl}_2$  and n-Butyl  $\text{SnCl}_3$ .
42. A particle according to claim 36 through 41, wherein the protic solvent hydrolysable halogen compound is deposited on the oxidizable metal particle from an essentially moisture free ethanol solution.
43. A particle according to any one of claims 36 to 42, wherein the composition is heat-treated at  $100^\circ$  to  $250^\circ\text{C}$  for 20-60 minutes.
44. A particle according to any one of claims 36 to 40, wherein the protic solvent hydrolysable halogen compound is present in amount from 0.1 to 50 wt% on the weight of oxidizable metal particles.
45. A particle according to any one of claims 36 to 44, wherein the iron is annealed electrolytic reduced iron having average numeral size of the particles of 5-80  $\mu\text{m}$ .
46. A particle according to any one of claims 36 to 44, wherein the iron has an average diameter less than 1.0  $\mu\text{m}$ .
47. An aromatic polyester wherein a particle according to any one of claims 36 to 46 is incorporated.
48. An aromatic polyester according to claim 47, wherein the polyester is selected from the group consisting of

polyethylene terephthalate and the copolymers thereof in which up to 10% by moles of terephthalic acid units are substituted by units from isophthalic acid and/or naphthalene dicarboxylic acids.

49. A preform according to claim 33, wherein the oxygen-scavenging composition is according to any one of claims 19 to 30.

50. A film-forming polymer incorporating oxygen-scavenging particle according to any one of claims 36 to 46, selected from the group consisting of polyamides, polycarbonate, PVC and polyolefins.